MISSOURI BOTANICAL GARDEN

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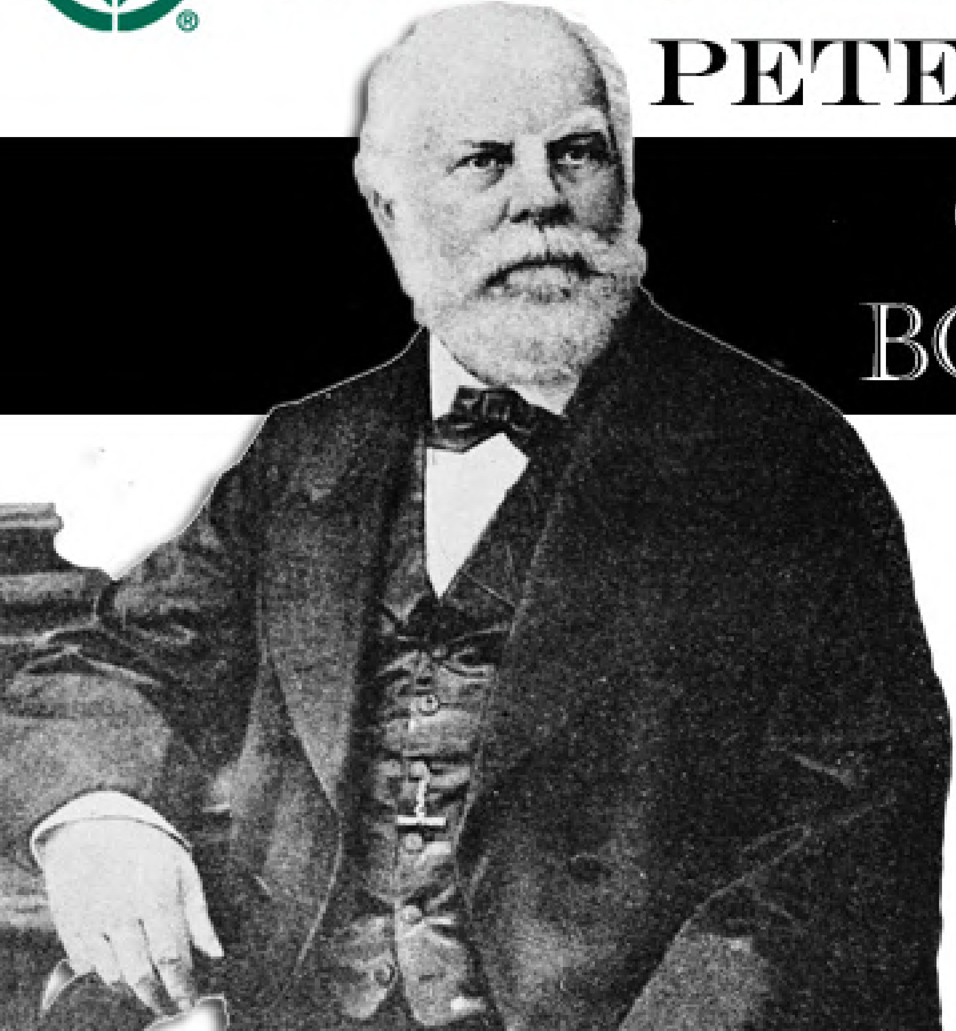

GEORGE ENGELMANN BOTANICAL NOTEBOOKS

Pagination Note:
Since many of the items lack a specific page number, the page number displayed online refers to the sequentially created number each item was given upon cataloging the materials.

Echinocactus Simpsoni is also common, growing
even to the Summit of the Pass. Sangre de Christo
10,000 feet

Parry 1867 Sept

1451

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MISSOURI
BOTANICAL
GARDEN

Hofrath Prof von

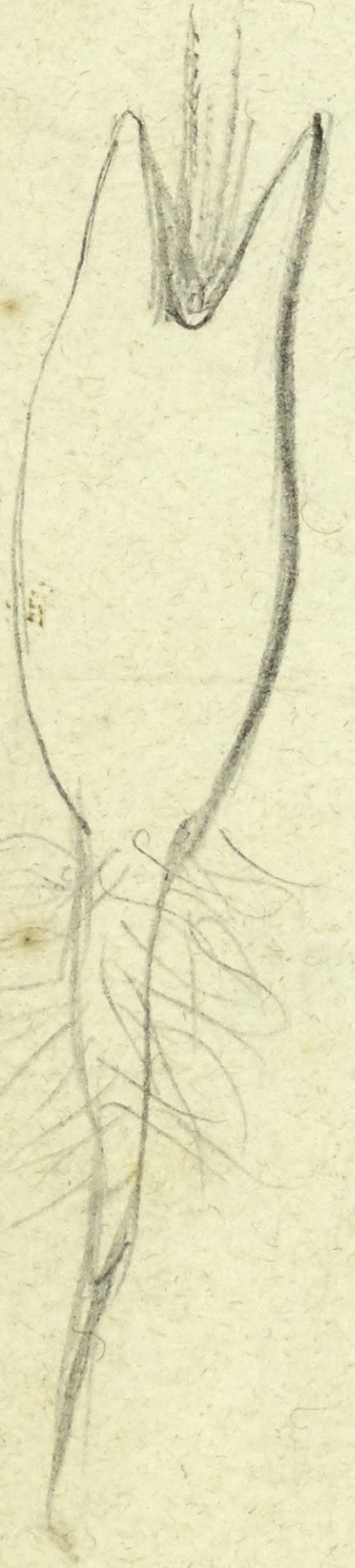
Mün

1860

Echin. Simpsonii

Utah

Seedling
4 weeks
old



1452

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MISSOURI
BOTANICAL
GARDEN

ALEX. LEITCH,
APOTHECARY & PHARMACEUTIST,
Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.

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MISSOURI
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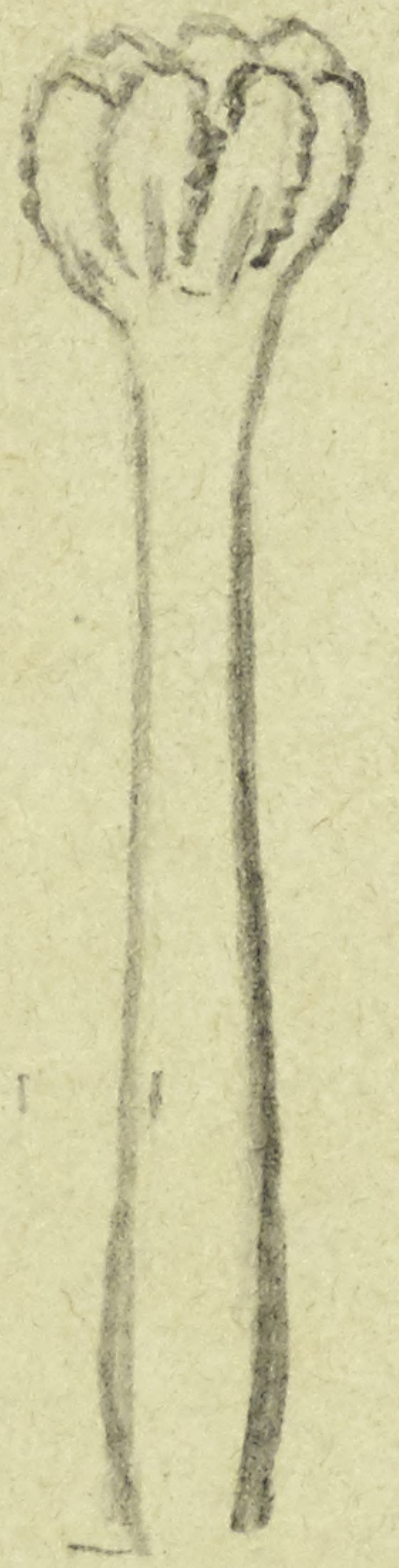
Echin. c Simpsoni

Nov 1860

1453

x4



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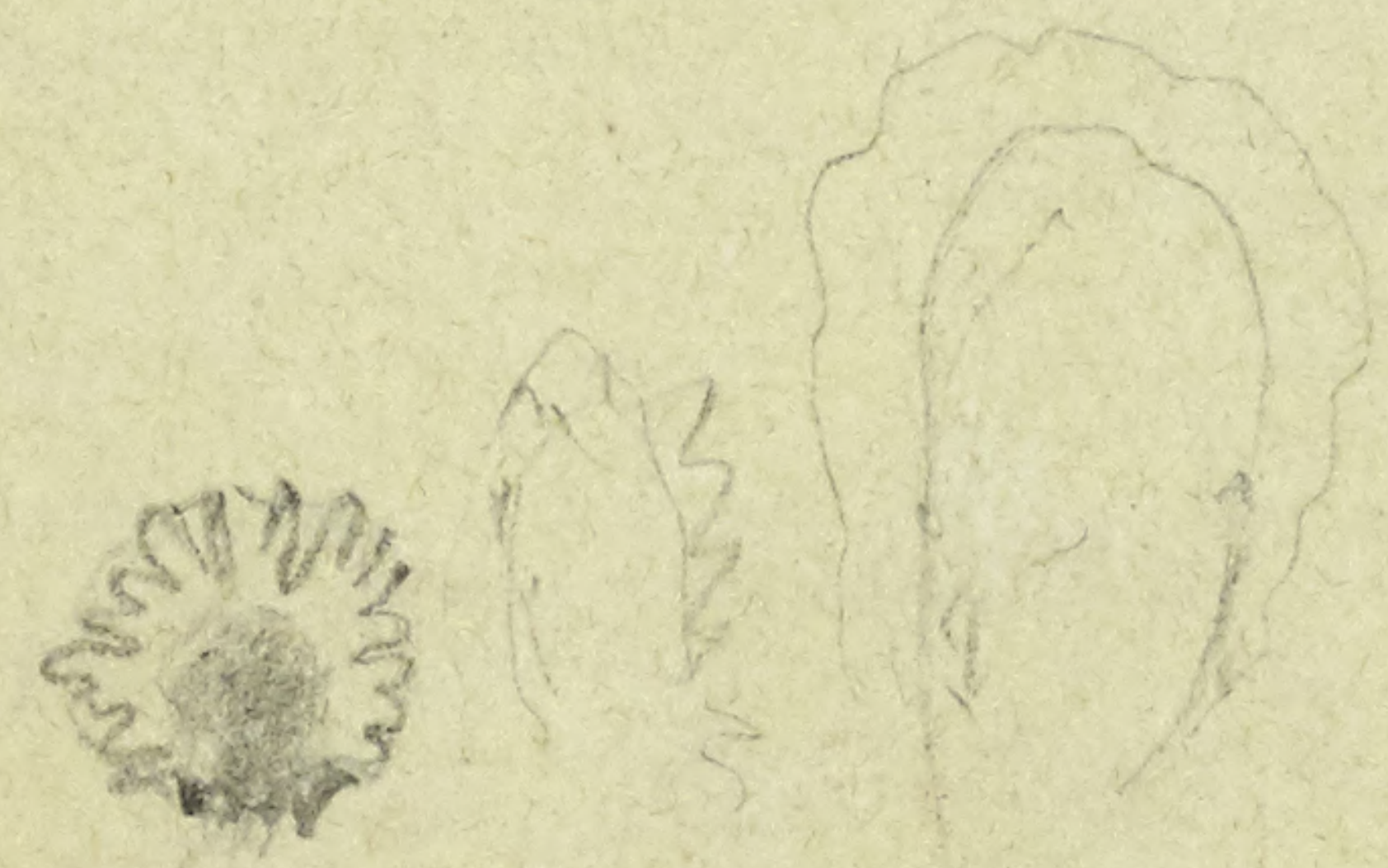
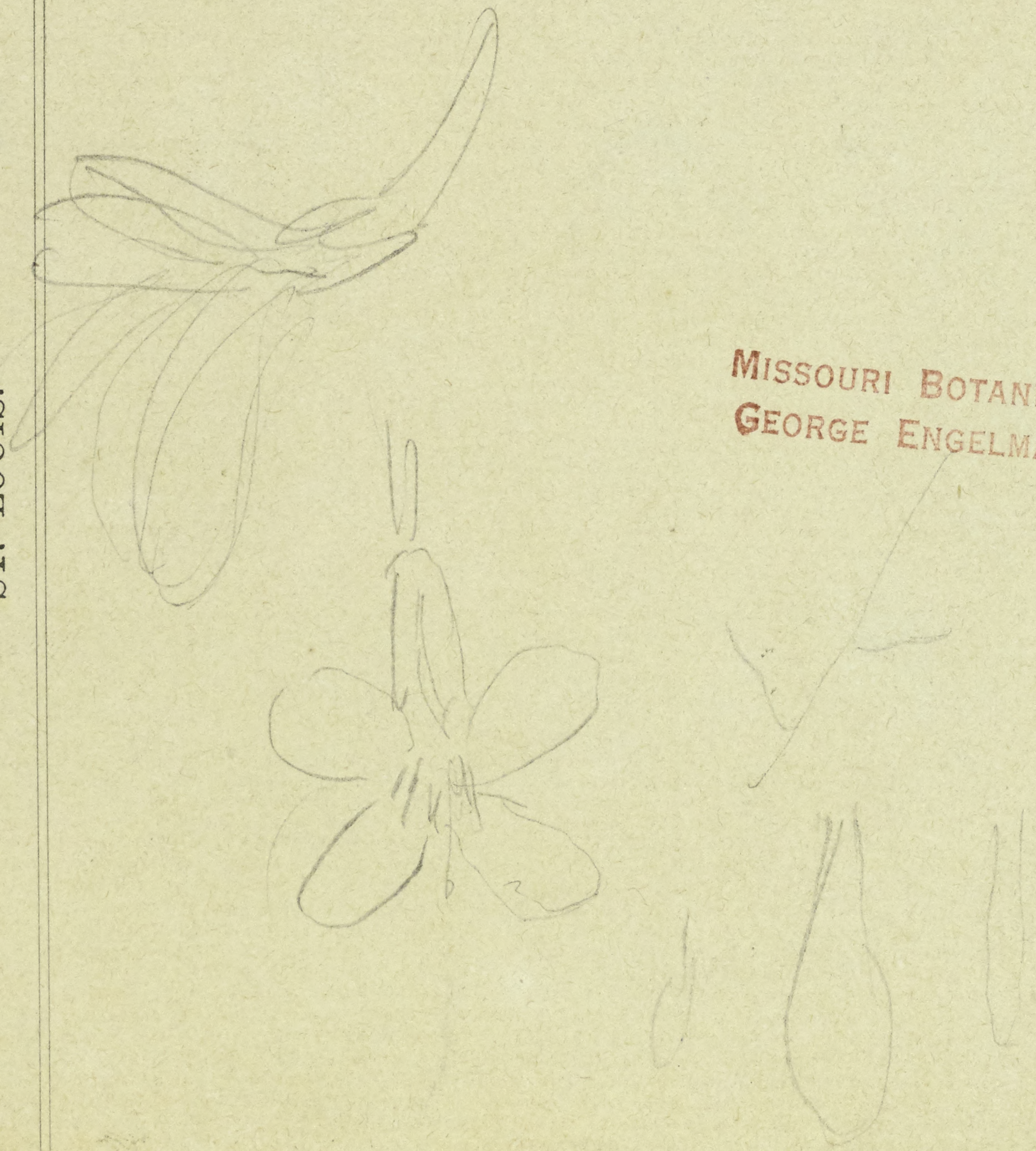


lowest sepal

2

20-25 sepals & same petals
12-13

M. W. ALEXANDER,
SOUTH-EAST CORNER OF FOURTH AND MARKET STREETS,
ST. LOUIS.



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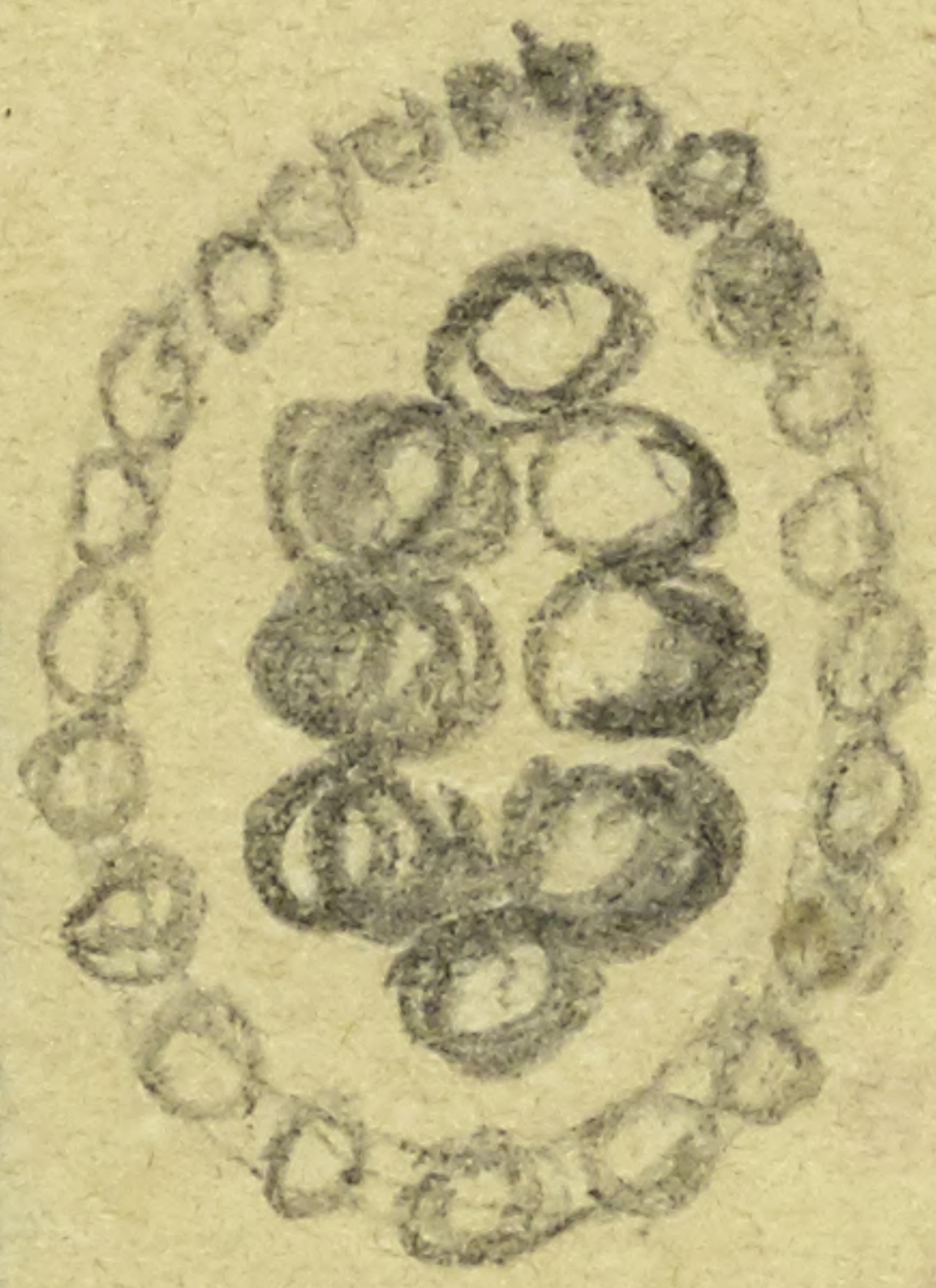
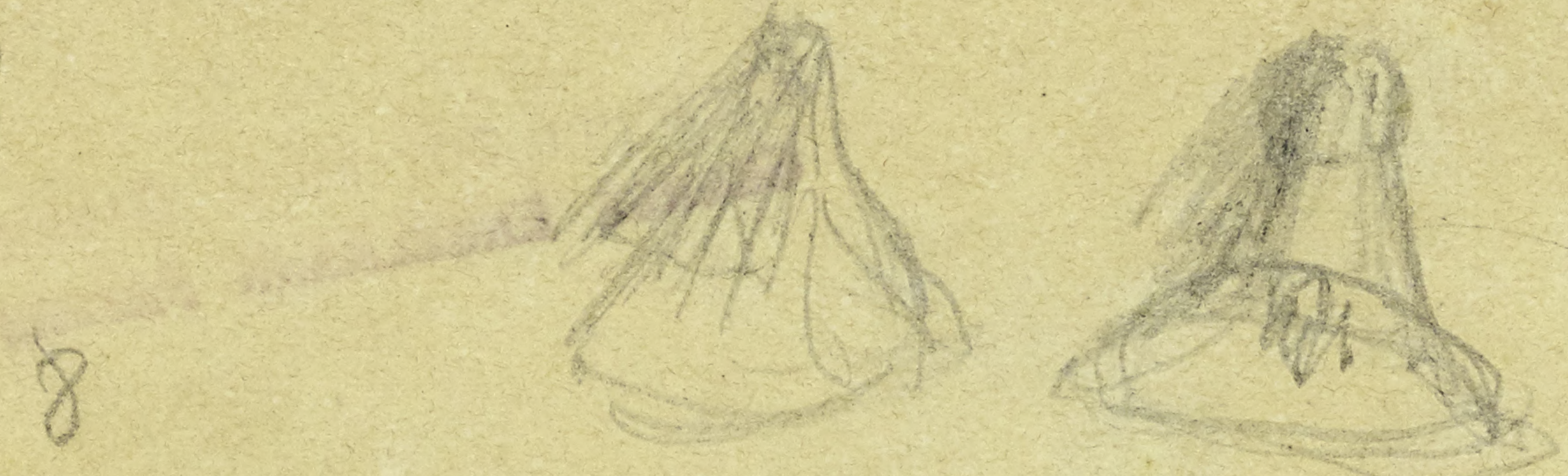
MISSOURI BOTANICAL GARDEN

Ech. Simpsoni 1454





20-24 ; 8

the uppermost
slenderest.

sepaloid
8-10 orbicular or reniform ovate scales
below, membranaceous on margin, fringed;
10-12 ovate obtuse sepals upwards,
also somewhat membranaceous, and
the lower yet fringed.
12-13 petals acute; stam. almost from base of tube;
5-7 short thick erect stig. — green
head

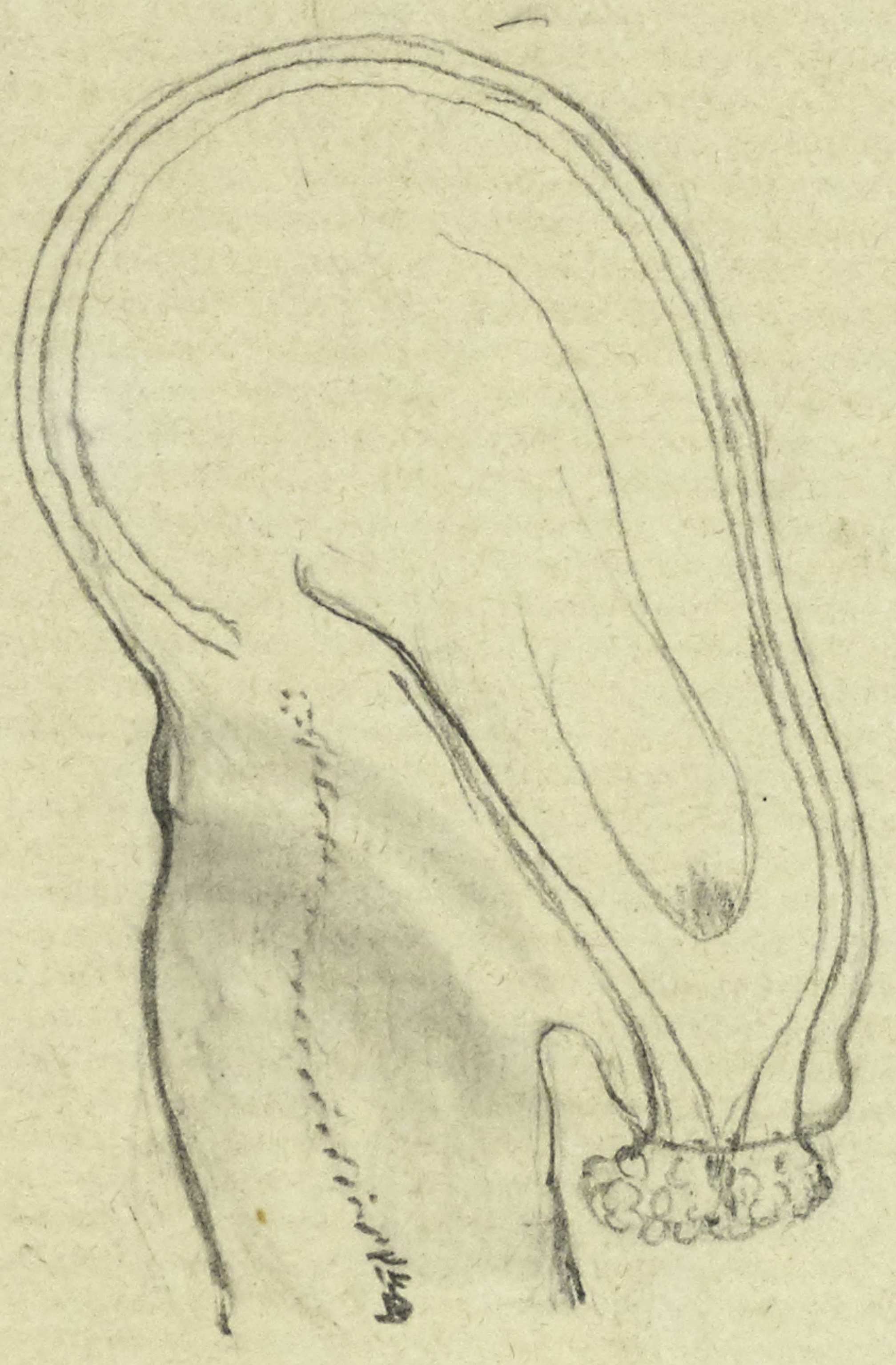
ALEX. LEITCH,
APOTHECARY & PHARMACEUTIST,
Marble Building, Cor. Fourth & Olive Sts. St. Louis, Mo.

Echinocactus Simpsoni March 1861

Pikes Peak

1455

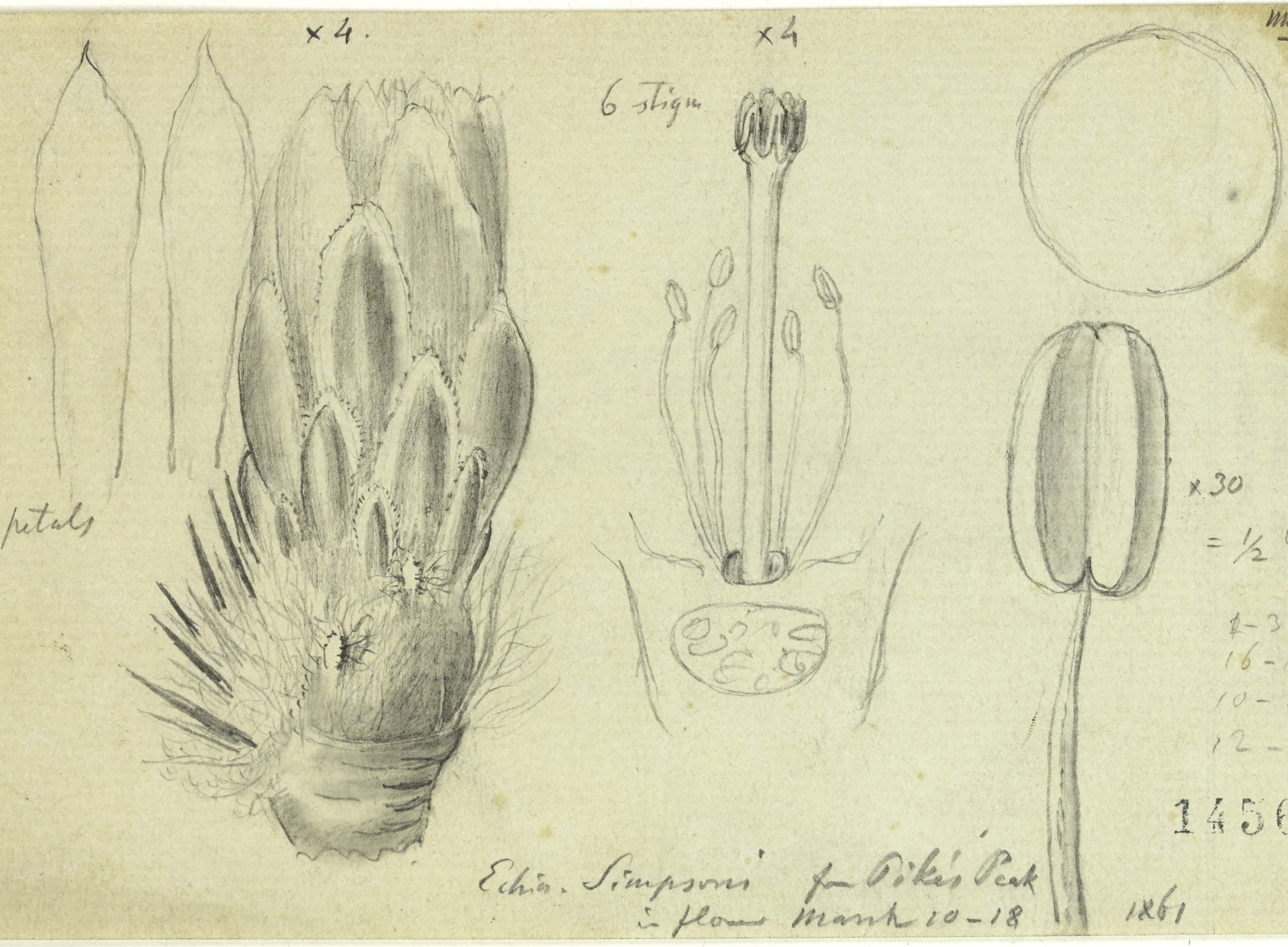
x60



funiculus rectus crassus brevissimus

M. W. ALEXANDER,
SOUTH-EAST CORNER FOURTH AND MARKET STREETS,
ST. LOUIS.

March 1861



$\frac{15}{412}$ lin

= ½ lin long

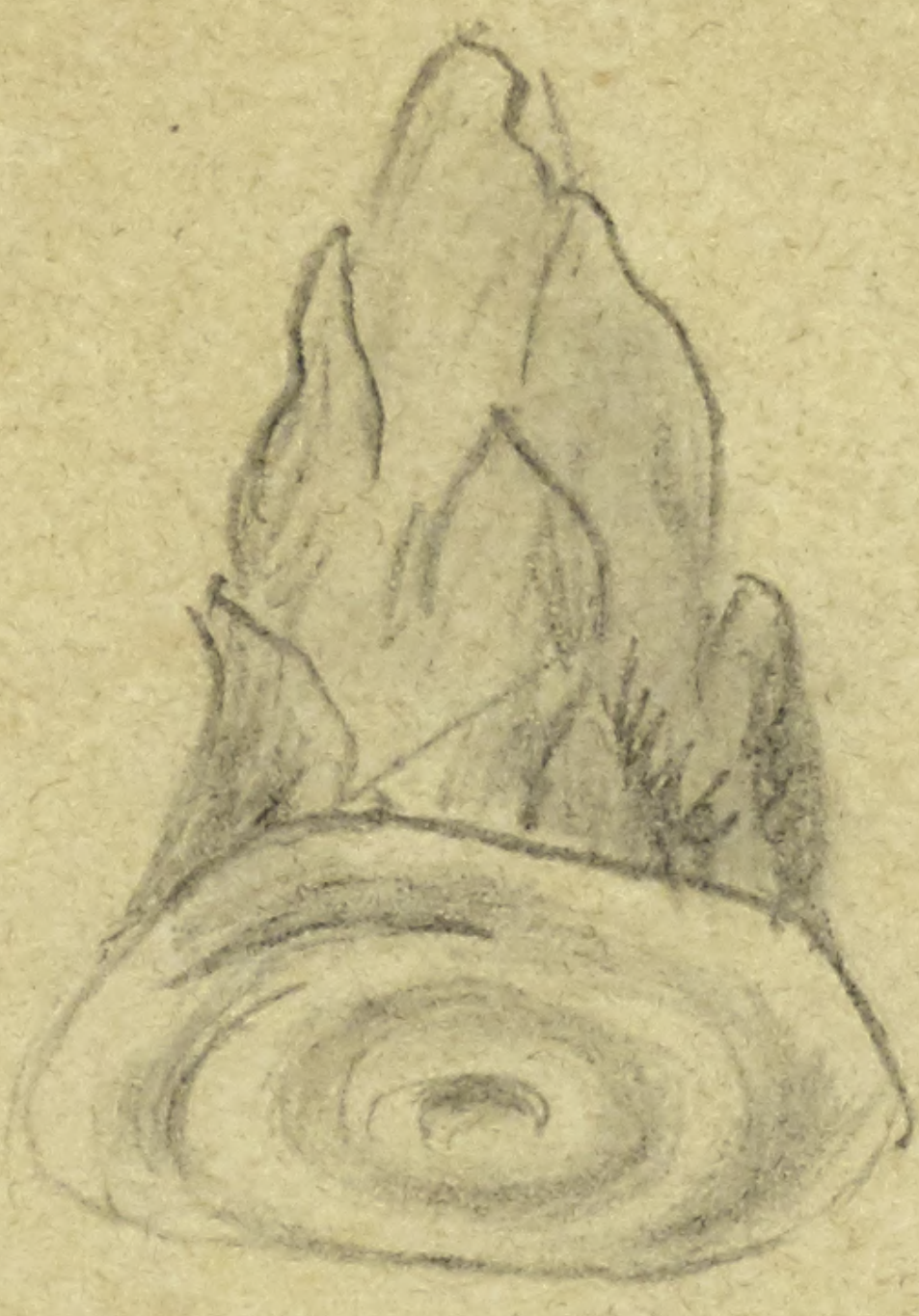
1-3 ext
16-18 low
10-13 upp
12-13 pet

1456 201

Echin. Simpsoni from Pike's Peak
in flower March 10-18 1861

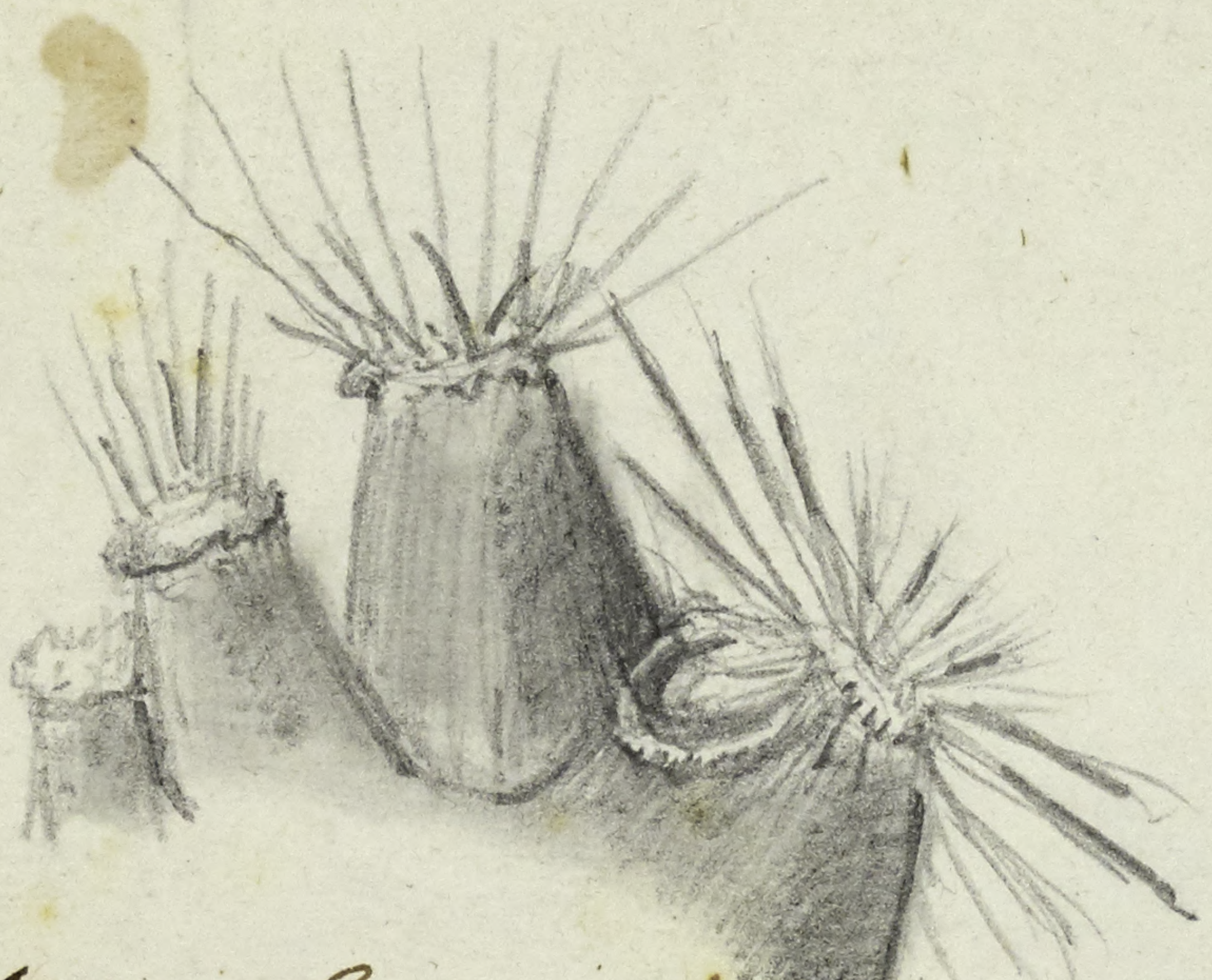
M. W. ALEXANDER,
SOUTH-EAST CORNER FOURTH AND MARKET STREETS,
ST. LOUIS.

1457

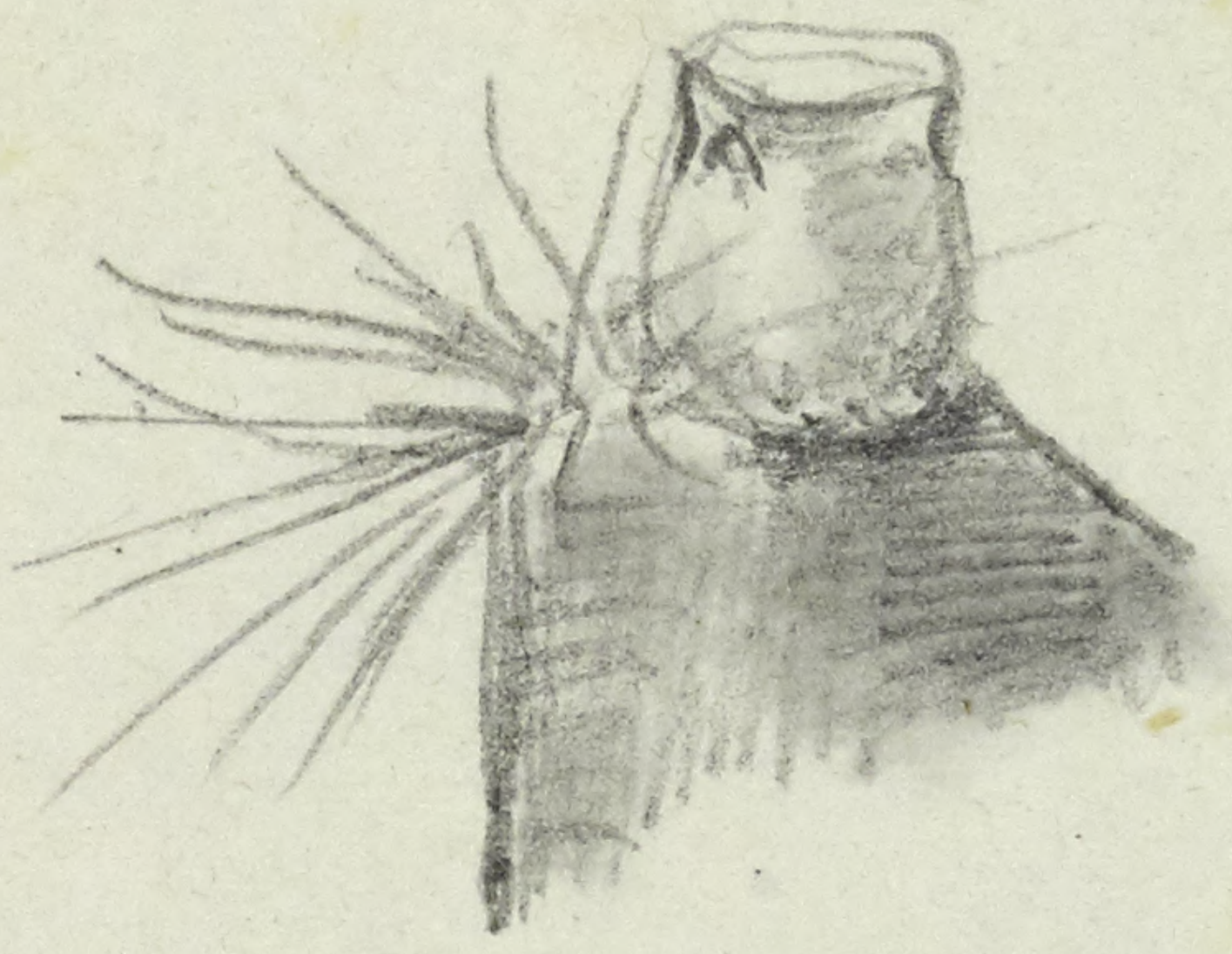


flower fallen off the
nearly ripe capsule

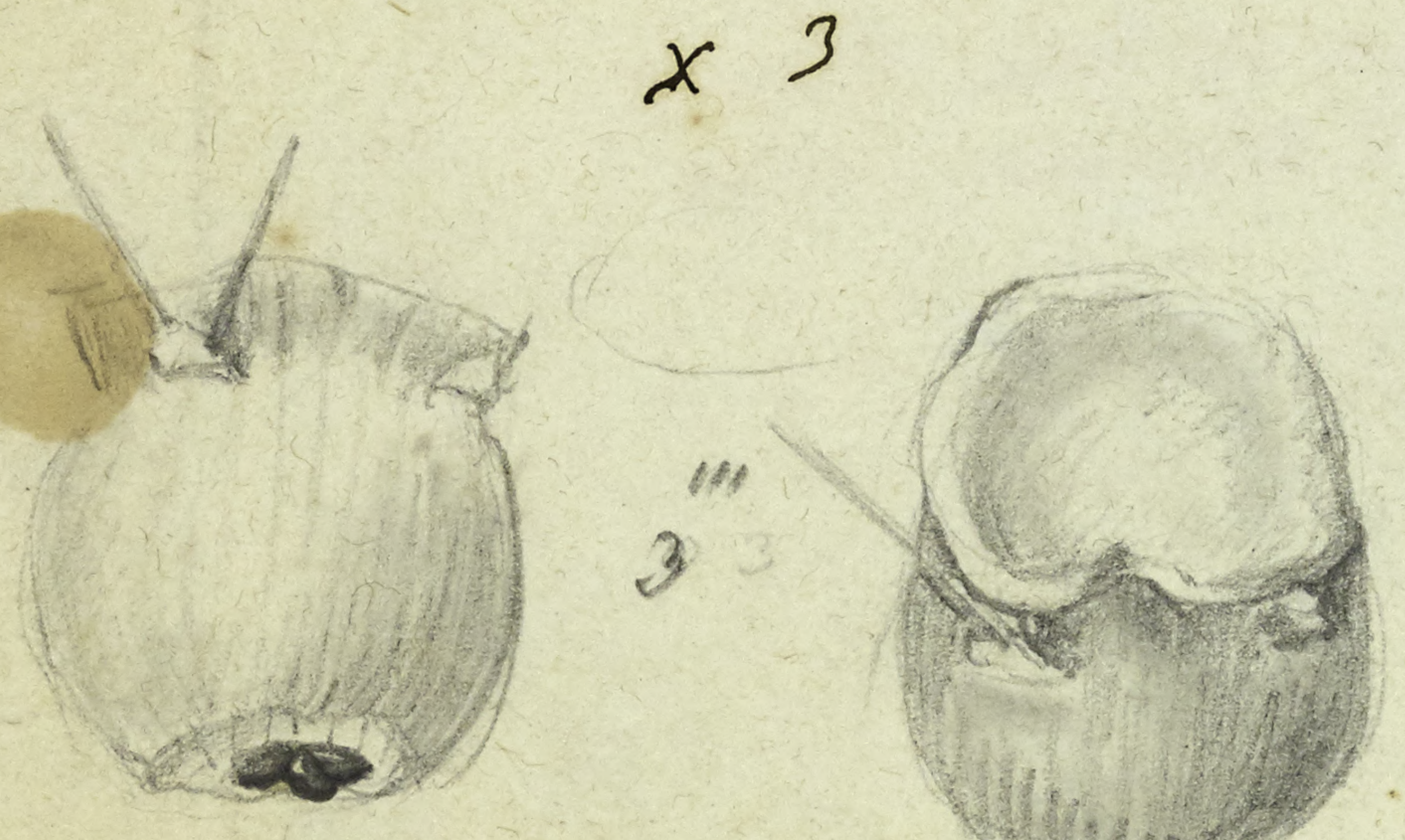
Echin. Simpsoni

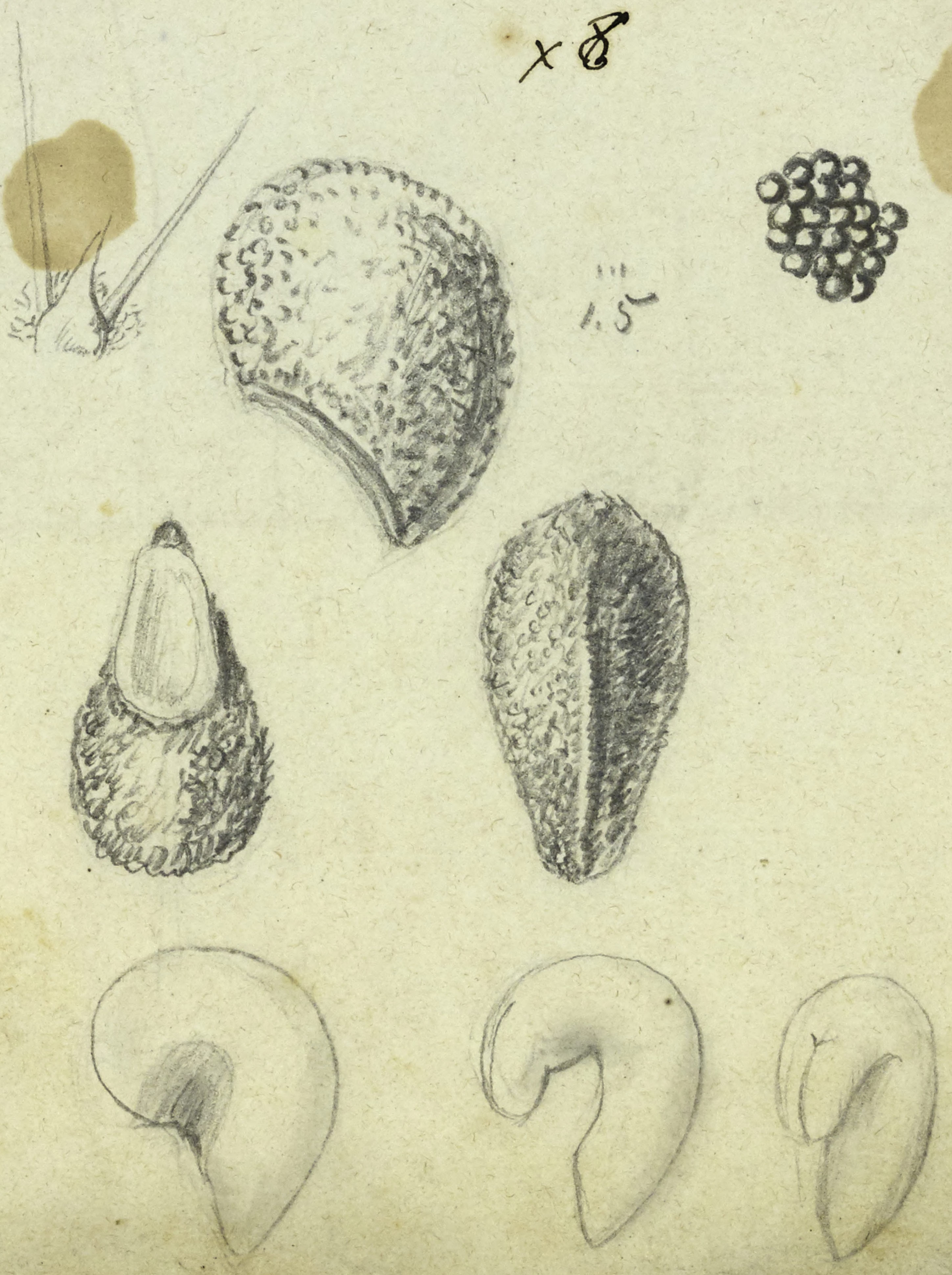


tubercles
towards the top
one of them with the
scar of a newly fallen
fruit



tubercle
with fruit





Dry green fruit
with 3 sepals
one of them with a
white spine in the axill
fruit open at the base,
seeds visible,
very wide umbilicus

ALEX. LEITCH,
APOTHECARY & PHARMACEUTIST,
Marble Building, Cor. Fourth & Olive Sts., St. Louis, Mo.

2, Echinocactus Simpsoni Specimens globose or semi-globose, head flattened or slightly pyramidal; mamillae, spines and seeds smaller than in the Utah specimens. — Smallest 1 inch diameter, globose, small tubercles in 8/21 arrangement; spines all round not more than 1½–2 lines long; 20–22 radial, some of them stouter, becoming central, 2 or 3 yellowish central ones. — Largest, flowering, specimens 4–4½ inches diameter 3–4½ inches high; one of them quite depressed; arrangement of tubercles in 21/34. Spines 4–5 l. long, abt 6 or 7 central, reddish brown and 22–28 radial ones white.

Pikes Peak region 1860

1458

1459

Engelm. Synops. Cact. p. 13.

Suppl. p. 72

~~Mamillaria vivipara Haworth~~ ~~Syn. [illegible]~~ ~~Torr & Gr. Fl. N. A. 2. p. 554~~
~~Cactus viviparus, Nuttall gen. 1. p. 295. In the South pass and on Sweetwater River. I have seen no specimens of this wide spread species from the other side of the Mountains.~~

Echinocactus Simpsonii, (spec. nov.): e radicibus fasciculatis simplex subglobosus seu depressus, basi turbinatus, mamilliferus; tuberculis laxis, apice oblique truncatis, axilla nudis, ovatis & junioribus ~~superioribus~~ leviter compressis basi e corpore productis vetustioribus obcompressis basi dilatatis; ~~apice oblique truncatis~~ areolis ovatis s. ovato-lanceolatis nascentibus ~~[illegible]~~ dense albo-villosissimis mox nudatis; acul. ext. radiantibus ~~20-25~~ ~~[illegible]~~ sub 20 tenuibus rigidis rectis albidis, additis supra (2-5 aculeis) minoribus setaceis; interioribus 8-10 erecto-patulis robustioribus obscuris; areola florifera (aculeifera ~~[illegible]~~ contigua) sub ~~tuberculi~~ tuberculi apice circulari; floribus in vertice dissitis ~~sparsis~~, minoribus; ovario brevi squamis sepaloideis triangulatis ~~[illegible]~~ paucissimis (1-3) instructo; sepalis tubi ~~8-10~~ brevis late infundibuliformis orbiculatis seu ~~[illegible]~~ ~~superioribus~~ ~~[illegible]~~ supra ovatis obtusis membranaceo-marginatis crenulatis fimbriatis; sepalis s. s. petaloideis 10-12 ovatis obtusis integriusculis; petalis 12-13 oblongis ~~acutis~~ cuspidatis (crenulatis apice) (~~purpureis~~ et virescentibus roseis); stigmatibus 5-7 brevibus erectis in capitulum globosum ~~congestis~~ compactis; bacca parva (sicca viridi) umbilico latissimo truncata, ~~flore~~ squamis paucis subnudis aculeiferis instructa, flore marcescente demum deciduo coronata, irregulariter ad modum folliculi lateraliter dehiscente; seminibus magnis obovatis obliquis minute tuberculatis, hilo magno ovato subbasilari; embryone ~~hamato~~ circa albumen parcum ~~fere circum ducto~~ fere convoluto hamato.

~~[illegible]~~ ~~[illegible]~~ β. minor; tota planta, ~~tuberculis~~ tuberculis, aculeis, seminibusque minoribus.

floribus

‡ var. β. comes from the [illegible] ~~Ruby~~ region; — see next page

Butte Valley in the Utah Desert, and Kobe Valley further west; fl. in May, fr. in July & August. ~~‡ This interesting~~ plant, ~~as if it~~ on the whole ~~forms~~ constitutes the closest and most imperceptible transition to ~~the~~ Mammillaria subgenus ~~sect~~. Coryphanthe (see Engelm. Synops. p. 8) ~~and on the other side it is by all its more important characters so intimately allied with the very compact Echinocactus intertextus Engelm. in Cact. Boundary p. 27 tab 34, that it can only be separated from them.~~ ~~Coryphanthe~~ which bear the flowers in the axils of the nascent tubercles (the flowerbearing & the spine-bearing areola being united by a woolly groove); in M. macromeris Eng. they are produced on the middle of the tubercle (Bound. Cact. tab 15 fig 4) and in the section in ~~species before~~ question ~~or~~ they advance to the top of the ~~areola~~ tubercle, close to the spines, thus assuming the position which the flowers ~~of~~ regularly occupy in the ~~species of the~~ Genus Echinocactus (See Bound. Cact. t. 20 f. 2 t. 21 ~~(Note)~~ t. 25. f. 1, t. 27. f. 1 t. 28 f. 2)x

note x) An exception is ~~found~~ in Ech. brevihamatus Eng ~~Cact Bound tab 19~~ fig 2. 3. where the flower is situated exactly as in Coryphanthe at the base of the tubercle and ~~distinct~~, connected with the distant spiniferous areola by a woolly groove; see Cact Bound. t. 19 f. 2. 3.

The ovary also is almost naked as in Mammillaria, ~~or~~ generally has only a few scales as in M. macromeris. On the other hand the ~~dry~~ fruit which ~~I have~~ is often seen dry in Echinocactus, but never in Mammillaria, the black tuberculated seeds ~~and~~ especially the large & curved embryo and the presence of ~~an~~ albumen ‡ do not permit the separation of it from Echinocactus; ~~in~~ this species is also interesting ~~as furnishing another striking example~~ ~~Our Plant offering another instance of the very slight importance of the other~~ general

3. Simpsoni Cactaceae.

because it again strikingly proves that the general appearance, the habit, of a ~~species of~~ Cactaceae ~~in regard to its real affinities.~~ not necessarily indicates its real affinities; not only is it with every appearance of a Mammillaria ~~[illegible]~~ an Echinocactus, but it is moreover closely allied ~~to the~~ in all its essential characters to the very compact & ~~[illegible]~~ ribbed Echinocactus intertextus Engelm. C. Bound. p. 27 t. 34; it has the same small flowers, the same (dry & small) fruit with few large ~~black~~ seeds, though not entirely the same arrangement of the spines, ~~[illegible] and the flowers~~

↑ ~~This species~~ With the New Mexican Echin. papyracanthus ~~Mexican~~ Echinocactus * horripilus Lem. and perhaps the South ~~[illegible]~~ E. Odieri Lem. and E. Cummingii Salm. and probably 1 or 2 others this species

*, ~~I then name~~ the plant ~~which~~ I formerly described as Mammillaria papyracantha (Plant. Fendl. p. 49. Synops. Cact. p. 8,) ~~evidently~~ proves to belong to this widely adopted section of Echinocactus; ~~farther on~~ a closer examination of the dry specimen ~~gathered~~ obtained by Mr Fendler ~~proves that~~ shows that the ~~[illegible]~~ floral areola joins to spiniferous one on the top of the small nascent tubercles. It is remarkable that thus far Mr Fendler's single specimen has remained the only one ever obtained of this pretty species

form the small section of Echinocacti with the appearance of Mammillaria (Theloidei tuberculis spiraliter dispositis distinctis Salm. Cact. Hort Dyck. 1849. edit. p. 34.); ~~They form it.~~ constitute

1460

Full grown specimens of E. Simpsoni are 3–5 inches high and 3–4 inches in diameter, dark green, ~~full of~~ the tubercles ~~loosely~~ arranged in $\frac{8}{21}$ or $\frac{13}{34}$ order, 8 and 13 spirals most prominent, somewhat 4angular; they are 6–8 lines long, at base 6–7 lines wide in the vertical and 7 or 8 lines in the transverse diameter, becoming subcylindric upward

4

areola 3-4 lines long, ovate or lance-ovate; the fruit-bearing tubercles are rather stouter and shorter; External spines 4-6 lines long, whitish, interior ones also spreading stouter and a little longer 5-7 lines long yellow, ~~with~~ deep brown or black upwards; no truly central spines. In the very young plant the spines (18-20 in number (1-1½ lines)) are all radial, closely compact ~~with~~ compressed bulbous bases, ~~similar~~ on a linear areola, resembling the arrangement in Cer. pect. Soon afterwards the areola becomes wider, and 6 or 8 short ~~stout~~ brown interior but (sp. appear, horizontally diverging), ~~until~~ ~~soon after~~ next the ordinary arrangement as described takes place. —

The flowers are 8-10 lines long and of nearly the same diameter, their color is externally greenish purple, the petals yellowish green or verging to pale purple. The short stamens arise from the whole surface of the tube, leaving only a very small nectariferous space ~~in~~ at its base. The fruit is about 3 or 3½ lines long and almost as wide born on a very large circular areola surrounded by wool (in tab 2 fig. 1.

(# it seems that late in the fall or early in spring the young tubercles on the top of the plant begin to form, exhibiting ~~a loose and~~ the densely woolly tops, and soon afterwards long before any spines make their ~~appearance~~, the ~~young~~ flower buds ~~are seen as~~ smooth dark brown ~~pt tubercles~~ surround by their wool come out.

it bears towards its top 1-3 small scales ~~containing~~ with 1 or 2 small spines in their axils; ~~the fruit~~ usually ~~opening~~ with an irregular lateral slit, ~~the~~ falling off, its base remaining attached to the areola ~~leaving~~ a as in many (or all? or only (all the dry fruited?) Echinocacti, (C. horizonthalonius) thereby producing a basal opening ~~of the fruit~~ (see ~~tab~~ 2. fig 5.). (~~covered~~ with minute closely set tubercles

The seeds are ½ lines in the longest diameter).

The young seedling shows erect pointed cotyledons and ~~after~~ when a few weeks old begins to develop its pubescent spines. ~~It~~ (A var. β. has been received this fall fr the Mts Rok goldregion

~~Expl. of plate~~, ~~in many specimens of~~ [illegible]

Figures, sent to Capt Simpson Dec 28 1860

Pl. 1. Echinocactus Simpsoni in ~~early~~ ~~spring~~ the fall, ~~before~~ ~~flowering~~; on the top the young growth of tubercles ~~is~~ visible ~~with~~ ~~their~~ tops covered with white wool.

Pl. 2 Details of the same.

fig 1. ~~several~~ 4 detached tubercles with their spines, one of them shows ~~the~~ broad scar where the fruit has fallen off; another one is just growing, ~~the~~ exhibiting no spines yet in the thick wool.

fig 2. a detached tubercle with ~~the~~ a ripe fruit, showing its position close to the spines.

fig 3 & 4 flowers with the upper part of the tubercle and ~~the~~ young spines

fig 5 & 6 ripe fruit, ~~magnified~~ 5 times nat. size; 5 showing the basal opening and 6 the ~~[illegible]~~ umbilicus

fig 7 is a scale on the fruit, more magnified with ~~its~~ axillary spines.

1461

fig 8–12 Seed; 8 nat. size, the others 8 times the nat. size ~~magnified~~; 9 lateral 10 dorsal 11 basal view 12 surface, highly magnified.

fig. 13. Embryo enveloped in the inner membranous seedcoat including also the albumen, magnified

fig 14 ~~15 Embryo~~, ~~the~~ lateral 15 frontal view of the embryo magnified.

fig 16 seedling, a few weeks old, magnif.

fig 17 ~~tub~~ 4 tubercles of the smaller variety (from Pikes Peak) taken in the fall from near the vertex, in every state of development.

~~and larger~~. The smallest was 1 inch in diameter, globose, the small tubercles in 8/21 orders, spines 1/2–2 lines long all recurved; sometimes 1–3 darker stouter ones in the center; the larger specimens about of the size of those of Utah, but often depressed in the center; (The larger spines are only 4–5 lines long, 20–28 exterior ~~the~~ tubercles are small and arranged in 13/34 or 21/54 orders; and 6 or 7 interior ~~ones~~, ~~the external spines~~.

Expl. of Plate see next page.

This species has been named in honor of the Commander of the Expedition.

1462

Notes on Echinocactus Simpsonii Eng
(from specimen Mt Vernon) C C Parry. 1862

Plant pyriform globose, flattened depressed at summit 4½ inch high, 4 inch diameter broadest part; whole plant densely occupied by tubercles, crowned with bunches of spines; tubercles disposed in parallel spiral rows, the rows from left to right being more horizontal those from right to left more perpendicular. the lower tubercles much crowded and at the lowest part shedding off their spines: Middle tubercles about ¼ inch apart. sharply projecting upwards & outwards ½ inch long smooth green flattened perpendicularly at top conical crowned with the bundles of spines upper tubercles (inside the flowers) much crowded with the redish spines imbedded in white wool

Spines composed of about 8 central ~~longer~~ stouter red pointed ½ inch long disposed in two projecting rows on each side . Areolar spines white fine 20 or more ½ inch long projecting horizontally. Flowers in a circular row. 10 to 20 (pink) occupying a circle outside of present seasons growth by which they are pushed outwards. the remains of previous seasons flowers seen by scars & old fruit about 6 spines below Flower set in the axils of the spines in connection with the wooly tissue in which they are imbedded Fruit smooth 3/8 inch long ¼ inch wide crowned with the remains of the dried flowers when removed leaving a deep umbilicus. a few scattering membranaceous scales on the fruit Seeds, not mature (to collect)

Internal structure composed of a central pyriform shaped Medulary portion 1½ inch diameter surrounded by a row of woody fibres which sends branches through the outer cellular tissue to the apex of each tubercle.

Hab. rooting in coarse gravel or crevices of crystaline rocks deeply inrooted variable in size. the specimen examined being one of the largest. Fl May. fr—

Abundant near Mt Vernon & base of the Mts

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Eck. Simpsoni

strongly hooked embryo and the presence of an albumen

This plant together with Mam. macromeris evidently unite the genera ~~Mamillaria and~~ Echinocactus with the Mamillariae coryphantheae

The oldest bunches of spines, or therefore the spines of the very young plant, resembles those of Cereus pectinatus; only ~~radial~~ spines one series of 18 or 20 closely pectinate (spines), and strictly horizontal of 1–1½ lines long occupy the linear areola; soon afterwards the areola becomes a little broader, and 6–8 short stout brown intermediate but also horizontal spines show themselves, until very soon the ordinary arrangement of spines takes place.

The arrangement of the spines, the small flowers, the short dry fruit approaches this plant to E. ~~[illegible]~~ intertextus, but that species has distinct ribs, fewer central spines and flowers from a dense vertical tomentum.